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AN ANALYSIS OF EFFECTIVENESS FACTORS
IN THE COMPLETION OF IT PROJECTS
– THE SUPPLIER'S PERSPECTIVE

Summary: The effectiveness of completing IT projects consisting in the implementation of a management support information system is still unsatisfactory, even though slightly higher compared to other countries. The scope of this article is to present research results concerning the effectiveness factors in completing IT projects that consist in the implementation of ERP, CRM, BI and DMS-class management support information systems from the supplier's perspective. The main research problem here is to verify the author's research up to this date, based on case studies, which allowed for the formation of a research hypothesis regarding the effectiveness factors in IT project completion. Understanding the supplier's views and cognitive maps is important for describing the logic of action that prevails amongst a wide range of enterprises in Poland in outsourcing management support information projects.

Keywords: project effectiveness factors, MIS, supplier's perspective.

Introduction

In Poland, the effectiveness of completing IT projects consisting in the implementation of management support information systems is still unsatisfactory, even though slightly higher compared to other countries. Research conducted in Poland indicates the causes of this phenomenon and analyses the effectiveness factors in IT project completion. A management support information system implementation project should also be studied considering the achievements of the new institutional economics, as a transaction regulated by a contract between the client and the supplier during the whole life cycle of the project, and not only as

an organisational project and IT venture. This approach allows problems and issues that underpin both the relations between the supplier and the client, and the project agreements, where the goals and interests of both contract parties are contradictory, to be highlighted. The consequence of this approach is an attempt to identify the factors that inform the effectiveness of IT project completion from the supplier's and the client's perspective, which may differ. The scope of this article is to present research results concerning the effectiveness factors in the completion of IT projects consisting in the implementation of ERP, CRM, BI and DMS-class management support information systems from the supplier's perspective. The main research problem here is to verify the author's research up to this date, based on case studies, which allowed for the formation of a research hypothesis regarding the effectiveness factors in IT project completion. Understanding the views and cognitive maps from the supplier's perspective is important for describing the logic of action predominant in outsourcing in the area of management support IT project completion amongst a wide range of enterprises in Poland.

Outsourcing in IT projects from the perspective of the new institutional theory

According to J. Lee [Lee, Miranda, Kim, 2004, pp. 110-131], IT outsourcing means managing a company's IT infrastructure through administration mechanisms performed in cooperation with external organizations. Theory analysis of IT outsourcing research, conducted by J. Auksztol [2008, pp. 50-51], has indicated six prevalent theory groups describing these questions: the theory of transaction costs, resource allocation theory, strategic management theory, knowledge management theory, contract theory and agency theory. Three of them, i.e. the theory of transaction costs, contract theory, and agency theory, are grouped as the new institutional economics, which means that they become a key tool in developing the concept of IT outsourcing. Analysing the effectiveness of outsourcing from the perspective of these three theories makes it also possible to view the phenomenon through common ideas, notions and terms — mostly social institutions and, as part of them, contracts. This is the reason to use two out of the three main theories of outsourcing concept development, i.e. the theory of transaction costs and agency theory, in research on the effectiveness of IT project completion through outsourcing.

The current theory of transaction costs was created by O.E. Williamson [1979, pp. 233-261], while its conceptual basis was presented by R.H. Coase [1937, pp. 386-405] in his classic publication on the characteristics of enterprise. An interesting definition of costs was presented by J.A. Robins [1987, p. 69], resulting from the research area that he analysed: costs linked to economic exchange, where changes do not depend on the market prices of the exchanged goods and services. They cover the costs of research and information, as well as the cost of monitoring and guaranteeing the proper execution of the contract. According to I.R. Macneil's [1974a, pp. 691-738; 1974b, pp. 589-610] costs theory, contract typology is as follows:

1. Classical contracting assumes that both sides of the contract have the ability to foresee all the future events and situations. Thanks to this, they can design terms of agreement regulating all the external factors and clearly codifying the behaviour of both parties.

2. Neo-classical contracting challenged the possibility of fully predicting the future, which makes formulating a perfect agreement impossible. Constructs adopted at the moment of signing the agreement assume the necessity of making changes to the initial contract provisions.

3. Relational contracting maintains the thesis about the lack of possibility to conduct the process of contractual actualisation and shifts attention from the subject of agreement, so the basis of classical and neo-classical contracting, to the connections describing the relations between both parties of the contract.

According to J. Auksztol [2008, pp. 50-51], the complexity of various contracting forms constitutes a starting point to developing a theory which is most frequently used to explain IT outsourcing, which means that from the perspective of theory studies, the way a contract is formulated determines the success of such a venture. Research[1] indicates that contracts for the completion of IT projects in Poland are prevalently neoclassical and relational. This results mostly from a big dynamic of client's functional and technological system requirements. The author's research has shown that in the market of management support information systems in Poland, the percentage structure of these types of agreements is as follows: 68% – fixed price contract, 27% – time and materials contract, 5% – cost-reimbursable contracts.

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[1] The research was carried out in 2013. It covered 500 enterprises where 895 IT projects consisting in the implementation of ERP, CRM, BI, DMS, BI and E-learning-class management support information systems were completed. The chosen enterprises operated in Mazovia and Lesser Poland. The research was conducted amongst enterprises employing over 400 people.

Agency theory stems from an attempt to explain the behaviour of both relation parties: principal–contractor, where both parties are focused on their own goals. According to Y. Lichtenstein [2004, pp. 61-65], agency theory may be used to describe the completion of IT projects, i.e. the negotiation of the transaction's trade conditions. Agency theory treats an enterprise as a cluster of contracts linked through the relations of agency, concluded between its individual participants, usually understood as shareholders, managers and creditors. Agency theory considers the question of risk-sharing, including the so-called agency problem occurring when both cooperating parties have different goals and division of labour. According to agency theory, a company owner is known as the principal and an IT system supplier as the agent [Kaataja and Tuunanen, 2006].

Y. Lichtenstein [2004, pp. 61-65] indicates that there is an incompatibility in both parties' interests and a clear contradiction between maximising the supplier's costs and the desire to complete an IT project with minimal costs as part of a fixed budget. Table 1 presents the contradictions between the client's and supplier's interest in the case of completing an IT project consisting in the implementation of a management support information system.

Table 1. Goals and interests of both transaction parties

Client's goals and interests	Supplier's goals and interests
• Fulfilling business goals • Fulfilling technological goals • Completing the project within the time frame • Completing the project within the maximum planned budget • Minimizing the total cost of software ownership (TCO) • Achieving functional and technological solutions creating a temporary competitive edge	• Completing the project according to the planned quality • Maximizing the project's profitability in its entire life cycle, i.e. implementation and usage • Obtaining reference information after the completion of the project, which will allow the supplier to sell services to other projects

Source: Own research.

The effectiveness of IT project completion

Systematic studies conducted since 1996 by an American research institute Standish Group constitute the most complex research in the field of IT project effectiveness analysis. It should be stressed that this organisation is seen as a credible and objective provider of statistical data concerning the effectiveness of IT project completion by the international IT industry. The research is conducted on the basis of data collected from fifty thousand IT projects, out of

which 60% were completed in the USA, 20% in Europe, and 15% elsewhere. It is worth noting that even though Standish Group do not state directly that they analyse IT projects consisting in the implementation of management support information systems, calling the analysed projects software development investments, on the basis of the type of end-users and the conclusions drawn from the research, it can be assumed that these are in fact management support software systems. Projects covered by Standish Group research vary in sizes – from small to very large.

Standish Group conducts research and analysis from the perspective of success factors, including the degree of compatibility between the function and characteristics of the project product and the requirements included in the user specification. Table 2 presents the distribution of IT project completion efficiency. The projects have been divided as follows:

1. Projects completed with full success, i.e. completed on budget, on time, with the implementation of all the functional requirements.
2. Project ending in partial failure, i.e. with a delay, exceeding their budget, without implementing all the required functionalities.
3. Project ending in complete failure, i.e. cancelled and never completed.

In 2012 as little as 39% of IT projects ended in full success. According to Standish Group's research history of 2004-2012, presented in Table 2, the average success rate was 34%, which means that on average 65% of IT projects end in complete or partial failure.

Table 2. Success rate distribution in IT project completion according to Standish Group 2013

Projects	2004	2006	2008	2010	2012
Projects completed with full success	29%	35%	32%	37%	39%
Projects ending in failure	18%	19%	24%	21%	18%
Projects ending in partial failure	53%	46%	44%	42%	43%

According to the results of research conducted between 2010 and 2014, presented in Table 3, the average success rate of IT projects[2] completed in Poland is 61%, which means that on average 39% of IT projects ended in complete or partial failure. It is noteworthy that the average rate of complete failure was

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[2]   The research applied to 450 IT projects carried out between 2012 and 2014 amongst 425 companies based in Mazovia, Greater and Lesser Poland, as well as Upper and Lower Silesia, which in this period completed projects consisting in management support information system implementation. The selected enterprises met the following criteria: number of employees – between 80 and 1000, own IT department, minimal income – 40 mln PLN. An average project budget covering only the services equalled 478,000 PLN. The analysed projects included the implementation of IT systems from ERP, CRM, BI, DMS and E-learning class.

only 19%. In-depth research showed that the average rate of projects completed successfully amongst enterprises with foreign capital equalled 62%, while amongst domestic capital enterprises it equalled 38%. Therefore, more projects end successfully in foreign companies. It is also interesting that a higher percentage of projects ending in complete failure can be seen in the cases of implementations completed in foreign companies (64%) than in Polish enterprises (36%). The reverse situation can be noted in the cases of projects ending in partial failure – a higher percentage occurs amongst Polish-capital companies (71%) than foreign-capital companies (29%).

Table 3. Success rate distribution amongst it projects in Poland

Projects	2010	2011	2012	2013	2014
Projects completed with full success	56%	59%	63%	64%	64%
Projects ending in failure	21%	19%	22%	17%	16%
Projects ending in partial failure	23%	22%	15%	19%	20%

Source: Own research.

To synthesize the research results, it can be indicated that between 2010 and 2012, success rates according to Standish Group were 37% and 39%, which means that in these years 63% and 61% of IT projects ended in complete or partial failure. Meanwhile, during the same period in Poland – in 2010 and 2012 – success rates equalled 56% and 63%, which means that respectively 44% and 37% of IT projects ended in complete or partial failure. It needs to be stressed here that, according to the author's research from 2014, the success rate equalled 64%, so the prospects are positive in this regard.

Research, whose results have been discussed in this publication, does not exhaust the studies conducted in order to recognise success factors from the supplier's perspective and the causes of failure in IT projects consisting in the implementation of management support systems. The majority of other research results are limited to general conclusions, not taking into account the impact of institutional economics explaining the model of project completion based on outsourcing. It applies to research conducted by K. Ewusi-Mensah [2003] and R. Glass [2001, 2002]. It is worth pointing out interesting articles on this subject written by Polish authors: B. Kubiak [ed., 2003], J. Szych [2000], J. Skalik and A. Strzelczyk [2013], B. Czarnacka-Chrobot [2009], P. Lech [2001, pp. 318-327], P. Soja [2007, pp. 98-114], and also fragments of books by J. Kisielnicki and H. Sroka [2005], as well as Z. Szyjewski [2001], dedicated to this subject.

Research methodology

The choice of research subject stemmed from the belief that the effectiveness of IT project completion, especially in Poland, may be dependent not only on the methods and techniques used to manage the projects, but also the complexity of various forms of contracting and their consequences resulting from the structure of transaction costs directly linked to the level of trust and agency theory, which focus on the contract as a relationship between the supplier and the client. Considering the contradictory interests of both parties in the entire project's life cycle, i.e. in the implementation stage and the usage stage of IT systems, it is worth analysing the factors influencing the effectiveness of project completion, both individually and from the supplier's and client's perspective. The main research goal is to identify the factors that, from the supplier's perspective, influence the effectiveness of completing IT projects through outsourcing, consisting in the implementation of ERP, CRM, BI and DMS systems as part of a fixed budget.

The research was conducted following a 3-step project and research formula. Using three research methods in three steps stemmed from the wish to conduct data triangulation and to verify the individual conclusions in consecutive projects.

Step 1. Literature analysis.

Step 2. Case studies allowing, on the basis of qualitative research, to formulate a research hypothesis, which will be verified in step 3. In step 2, the research was conducted in 2014 amongst 10 suppliers of management support systems. The research goal was to reach people on the supplier's side, who were indirectly or directly engaged in completing management support IT projects. The respondents were company owners, directors, members of the board and project managers. A total of 12 projects were analysed, including 4 ERP system implementations, 4 CRM implementations, 2 BI implementations and 2 DMS implementations. Case study workshops were mostly attended by project managers, senior managers and company owners. Table 4 presents effectiveness factors in project completion, along with their interpretation from the supplier's perspective, which constitute the results of research conducted in step 2. On the basis of step 2, a research hypothesis has been formulated, which will be verified in step 3.

The research hypothesis states:

H1: *Do factors-predictors presented in Table 4 really influence the effectiveness of IT projects consisting in management support system implementation from the supplier's perspective?*

Table 4. Identified effectiveness factors in project completion along with the supplier's perspective interpretation

Predictor code	Factor-predictor	Factor interpretation according to the supplier
P1	Precisely defined project scope	Project definition consists in defining a detailed functional scope, project goals, project group, time frame and financial budget.
P2	The quality of project management	The quality of project managers' skills, both on the side of the supplier and the client, the quality of IT tools used in managing IT projects.
P3	Achieving planned project profitability within a fixed budget	As part of the bidding stage, the supplier plans to achieve project profitability within a fixed budget. According to the research, the average profitability of analysed projects oscillated between 30% and 50%.
P4	Client's knowledge and awareness of IT system usage	Theoretical knowledge combined with practical skills concerning management support information system usage in the client's project group leads to smooth project completion.
P5	Realistic project completion schedule	The schedule should include realistic deadlines for specific project tasks, instead of expectations forced upon the supplier. Additionally, the schedule should contain safe time margins between the individual milestones, securing the final project deadline.
P6	Engaging project consultants with a high level of knowledge	The consultants engaged to work on the project should have relevant knowledge, skills and experience in IT project completion. The suppliers stress that in order to complete the project correctly, consultants should have at least 5-7 years of experience in a similar role, and the estimated employer's cost for this class of employees is around 13,000 PLN a month.
P7	Information asymmetry between the client and the supplier	It occurs when one of the parties has information that is additional to the information possessed by others, which can be used to achieve advantage. The suppliers point out that information advantage refers to both parties in different stages of project's life cycle. According to suppliers, information advantage is usually on the supplier's side in the bidding and negotiation stage, while in case of project completion it may occur on the client's side.

Source: Own research.

Step 3. Quantitative research using structural equation modelling. The research goal is to verify the research hypothesis put forward in step 2. Between September and November 2014, 52 suppliers of IT services[3] took part in re-

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[3] According to the author's research from 2014, there are between 250 and 300 IT companies in Poland, which provide both licences and implementation services of at least one ERP, BI, DMS or E-learning management support system. This group encompasses medium and large enterprises. The presented division results from dynamic decisions concerning the implementation of services linked to a given software being offered in the market by a given company.

search covered by step 3, completing an online survey consisting of the following number of questions for each factor-predictor: P1–6, P2–7, P3–7, P4-7, P5-6, P6-9, P7-8. Additionally, as part of the research, the same group of respondents was asked online questions concerning the success rate of their penultimate, last and current IT project. The quantitative methods employed in step 3, i.e. structural equation modelling, allow us to grasp the structure of relations between different phenomena where latent variables occur [Korol and Szczuciński, 2009, p. 73]. Due to the fact that structural equation modelling allows the modelling and testing of complex phenomena, it becomes an increasingly popular method of confirming or rejecting theoretical models with the use of quantitative methods [Schumacher and Lomaz, 2004, p. 7]. Structural equation modelling (SEM) is used for testing the fit of a given model to the data [Sztemberg-Lewandowska, 2008, p. 111], testing theory understood as certain hypothetical relations between conceptually defined variables [Blunch, 2008]. Its use allows the verifying of hypotheses, drawn from theoretical considerations, on the relations between individual variables, referring both to their occurrence, strength and direction [Korol, 2005]. Structural equation models are generally similar to multivariate regression models, although they are more flexible in case of describing interactions between the variables, especially qualitative, where classical assumptions of regression are not met [Sagan, 2000, pp. 52-64]. Until now, this method was widely used in medicine and social sciences [Brzeziński, 2004], but less popular in economics, even though it may be extensively applied in this field [Osińska, 2008].

Research results

What usually proves correct in empirical research is the degree of correlation of answers to questions, the indicator of one latent variable, with the use of a scale homogeneity index, internal consistency measured with Cronbach's alpha. This reliability coefficient assumes the value between 0 and 1. Generally, a 0.7 level is seen as satisfying [Churchill, 1979, pp. 64-73], while in case of exploratory research the value of 0.6 is also accepted. Table 5 details Cronbach's alpha coefficient values for individual factors-predictors. In order to analyse the measurement accuracy of the dependent variable, i.e. the evaluation of IT project completion, an analysis of reliability was also conducted, where the value of Cronbach's alpha coefficient equalled 0.64.

Table 5. Cronbach's alpha coefficient values for the analysed factors-predictors

| Analysed factors-predictors	Cronbach's alpha coefficient values
Project management	0.76
Engaging project consultants with a high level of knowledge	0.66
Asymmetry between the client and the supplier	0.65
Awareness of IT system usage	0.63
Defining project scope	0.58
Realistic project schedule	0.43
Achieving project profitability within a fixed budget	0.41

Source: Own calculations.

For verification purposes, a structural equation analysis with the method of maximum-likelihood estimation was conducted. The measures of a model's fit to data showed a satisfactory level of fit of the constructed model of regression to empirical data, which is visible in the following parameter values:

$$\chi^2(10)=13.22; p=0.21, RMSEA=0.08 \text{ (LO}=0.00 - \text{Hi}=0.19), CFI=0.95.$$

Table 6. Descriptive statistics

Predictors / Independent variables	Mean	Median	Mode	Standard error	Min.	Max.
Evaluate your current IT project	1.25	1.00	2.00	0.79	0.00	2.00
Evaluate your last IT project	1.41	1.00	1.00	0.50	1.00	2.00
Evaluate your penultimate IT project	1.23	1.00	1.00	0.69	0.00	2.00
Evaluate all your past IT projects in general terms	1.21	1.00	1.00	0.50	0.00	2.00
Average project evaluation	1.28	1.33	1.00	0.38	0.67	2.00
Defining project scope	6.08	6.25	6.50	0.58	4.00	6.75
Project management	6.26	6.33	6.17	0.44	5.17	7.00
Achieving project profitability within a fixed budget	5.24	5.40	5.40	0.69	4.00	6.60
Awareness of IT system usage	4.83	5.08	5.67	0.94	3.00	6.00
Realistic project schedule	6.00	6.13	6.50	0.68	3.75	7.00
Engaging project consultants with a high level of knowledge	6.00	6.17	6.17	0.61	4.17	7.00
Asymmetry between the client and the supplier	6.18	6.29	6.43	0.63	3.43	6.86

Source: Own calculations.
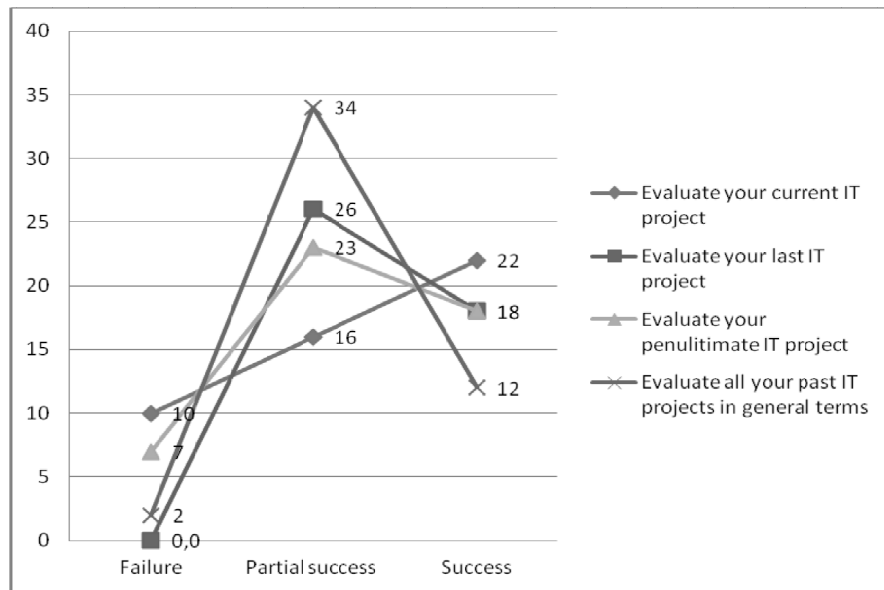
Fig. 1. The evaluation of the current, penultimate, last and all the previous projects

Source: Own calculations.

Coefficient of determination, also known R^2, is a measure that indicates the percentage of variability in the dependent (endogenous) variable, which in our case is the evaluation of IT project completion representing projects that ended in full success, i.e. projects completed on budget, on time and with the implementation of all the functional requirements.

The independent variables are seven predictors presented in Table 7. An analysis of R^2 coefficient has shown that predictors in the model explain approximately 28% of the variability in the results of IT project completion success presented in Table 7.

Table 7. The influence of studied factors on the evaluation of IT projects

x	β	B	Standard error B.	C.R.	Statistical significance
Achieving project profitability within a fixed budget	0.37	0.2	0.07	2.88	0.01
Engaging project consultants with a high level of knowledge	0.29	0.18	0.08	2.3	0.02
Project management	0.22	0.19	0.14	1.42	0.08
Asymmetry between the client and the supplier	-0.19	-0.11	0.09	-1.28	0.1
Defining project scope	0.06	0.04	0.11	0.37	0.71
Realistic project schedule	-0.01	0	0.1	-0.05	0.96
Awareness of IT system usage	-0.01	0	0.06	-0.07	0.94

Source: Own calculations

Figure 2 presents the correlations between independent variables, i.e. individual predictors, as well as between the predictors and the dependent variables, i.e. the effectiveness of project completion.
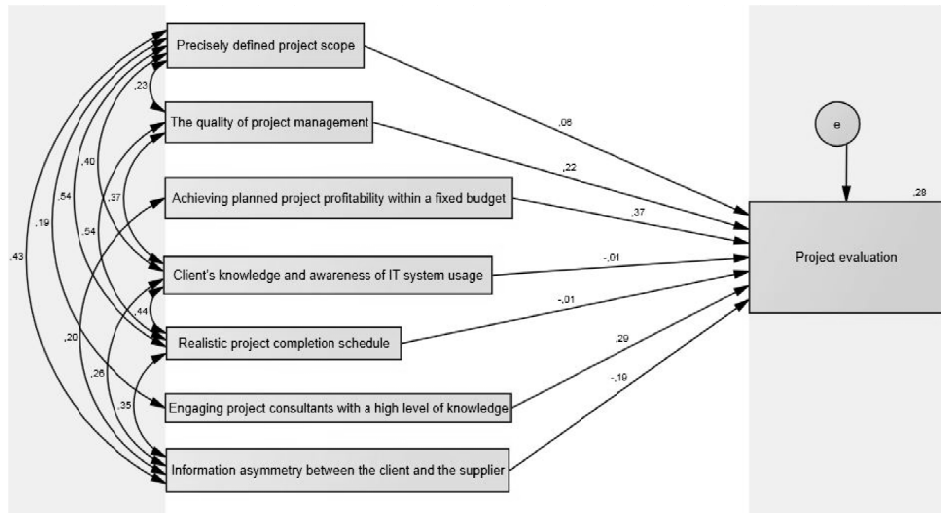
Fig. 2. The configuration model of correlations between the predictors influencing the evaluation of IT project completion

Source: Own research.

Table 8 contains information about correlations between predictors. The values of correlations in the sections of the table marked in grey correspond to the range <0.3;0.6.>, which indicates that there is a moderate correlation. The values of correlation for the other sections are smaller than 0.3, which shows a lack of a clear correlation between the predictors in this number of observations.

Table 8. Correlations between the predictors

x	x	x	Correlations	C.R.	Significance
Defining project scope	<>	Realistic project schedule	0.54	3.45	0.01
Project management	<>	Realistic project schedule	0.54	3.44	0.01
Awareness of IT system usage	<>	Realistic project schedule	0.44	2.87	0.01
Defining project scope	<>	Asymmetry between the client and the supplier	0.43	2.86	0.01
Defining project scope	<>	Awareness of IT system usage	0.4	2.67	0.01
Project management	<>	Awareness of IT system usage	0.37	2.45	0.01
Realistic project schedule	<>	Asymmetry between the client and the supplier	0.35	2.66	0.01

Table 8 cont.

x	x	x	Correlations	C.R.	Significance
Awareness of IT system usage	<>	Asymmetry between the client and the supplier	0.26	1.89	0.06
Defining project scope	<>	Project management	0.23	1.72	0.09
Achieving project profitability within a fixed budget	<>	Asymmetry between the client and the supplier	0.2	1.55	0.12
Defining project scope	<>	Engaging project consultants with a high level of knowledge	0.19	1.6	0.11

Source: Own calculations.

It is important to point out the limitations of the conducted research, lying in the limited respondent group sample, which led to the low values of Cronbach alpha coefficient. However, the measurements of model fit to data showed a satisfactory fit of the constructed regression model to empirical data.

Research results interpretation

The presented results of research, both qualitative and quantitative, aimed at identifying the factors that, from the supplier's perspective, influence the effectiveness of completing IT projects consisting in ERP, CRM, BI and DMS-class system implementation through outsourcing, lead to the following conclusions:

First of all, the SEM analysis has shown that the strongest factor-predictor influencing the effectiveness of project completion was achieving profitability within a fixed budget. The research has indicated a weak correlation between this and another predictor, i.e. information asymmetry between the client and the supplier. During the bidding process, the supplier plans project profitability, which according to the qualitative research spans between 30% and 50%. According to the respondents, the order portfolio for this type of projects with the aforementioned level of individual project profitability allows for the achievement of net turnover for an enterprise specialising in the implementation of management support information systems equalling between 10% and 16%. In order to compare the values, Table 9 presents a profitability index for chosen sectors of the economy.

Table 9. Profitability index according to PKD section in 2012

Specification	Sales of products, goods and materials profitability index	Gross turnover profitability index	Net turnover profitability index
Mining and quarrying	20.4	17.1	12.9
Manufacturing	4.9	5.1	4.3
Electricity and gas supply	8.5	9.8	8.3
Construction	-0.4	-0.8	-1
Wholesale, retail trade and repair of motor vehicles	1.8	1.7	1.3
Accommodation and catering	8.0	9.2	8
IT and communication[4]	8.7	9.7	8.6
Real estate	6.2	7.1	5.7
Other service activities	7.9	7.8	6.2

Source: Financial Results and Basic [2013].

Signing a contract to complete a project on the basis of a fixed budget guarantees the supplier a constant stream of income. During the qualitative research, all the suppliers stated that, caring for their reputation in the industry, they engage experienced project consultants, not young inexperienced personnel. The suppliers fear the occurrence of two factor-predictors that may threaten the achievement of planned profitability.

First of all, lack of a precisely defined project scope at the bidding stage. There are two consequences if this factor-predictor occurs: firstly, additional work, which was not agreed upon initially and not budgeted for, or less work in case of building a fixed budget based on more refined client requirements, which failed to materialise. As part of fixed budget contracts, clients sometimes behave in an opportunistic manner and try, as part of the contract, to impose completion of work, which was not excluded from the project scope clearly enough. Secondly, a lack of awareness of management support information system usage amongst the clients, which may cause an increase in project workload, e.g. increasing workload of data migration because of the client's failure to provide data for migration correctly. The materialisation of these two threats in the project poses a risk that the planned project profitability will not be achieved, as with a fixed agreed budget the workload will increase, due to additional work. The supplier who detects threats which may lead to decreasing project profitability in the initial phase of the project, will try to "defend" achieving their planned

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[4] IT and communication section does not include entities specialising in the sales and production of ICT equipment.

profitability by increasing the fixed project budget; if the client rejects it, they will try to lower the project completion costs in order to compensate for the increased workload. This identified logic, predominant amongst suppliers, can be called "project profitability defence".

The second strongest factor-predictor influencing the effectiveness of project completion that was identified is engaging project consultants with a high level of knowledge and experience. The suppliers believe that implementing a management support information system should be a catalyst for changes in an organisation, leading to economic and non-economic benefits. According to the suppliers, engaging young consultants and programmers lacking appropriate experience does not allow for the achievement of this, which means that they try to engage project consultants with at least 4-6 years of experience working on similar projects.

The third most important factor-predictor impacting project completion was project management. It is a group of activities linked to project coordination aimed at completing it within the schedule and achieving planned business goals. Qualitative research has indicated that the supplier's project group manager is responsible for putting the effort into achieving planned project profitability. The research has shown that suppliers assume 10% of the total system implementation budget to be directly linked to project management activities. Suppliers indicate that in case of a low level of client's awareness regarding management support information system usage, additional transaction costs may occur, i.e. the costs of monitoring the agreement's implementation. In this case, additional workload on the supplier's side may occur, linked to the tasks necessary to complete configuration acceptance testing.

Another factor-predictor, in terms of significance, is defining project scope, which is completed in the bidding stage. Research shows that this factor is correlated with other factors, such as information asymmetry between the supplier and the client and a low level of management support information system usage awareness on the client's side. Quantitative research has proven that defining project scope is strictly dependent on the client's knowledge and the level of their readiness to choose both an IT system and service supplier. A group of respondents on the supplier's side have pointed out that, in the current conditions of hypercompetition amongst the big implementation services suppliers, sales departments, trying to sell their projects at all cost, and to obtain a premium, often sell projects bordering on unprofitability with an unspecified scope. Meanwhile, the client who has negotiated the contract unaware of these circumstances remains satisfied. Respondents from the supplier's side stress that a lack of an effective verification of the sales process through implementation departments on the

one hand, and a determination to sell "any project in the current hypercompetition" on the other hand, may result in a situation where the project is already unprofitable in its initial stage, leading to an increased readiness on the supplier's side to undertake "defence activities" aimed at minimising the losses. Respondents from the supplier's side state that medium-size suppliers are in a more favourable situation, where the sales department is managed by a board member or a co-owner, who can eliminate such negative phenomena in the sales process.

A similar significance is attributed to a realistic project schedule and awareness of IT system usage. A realistic schedule means including project tasks with a realistic workload. Qualitative research has indicated that as part of good management practice, suppliers add the so-called safe time buffers between project tasks, which allows the risk of project delays to be minimised. An important factor-predictor, which has an impact on the effectiveness of IT project completion, is the client's awareness of IT system usage – knowledge allowing the client's project group to use the implemented IT system is necessary in IT project implementation.

In terms of influence, the final important factor-predictor is information asymmetry between the supplier and the client. Suppliers fear that a high level of information asymmetry in the implemented functionalities may influence the effectiveness of project completion. Qualitative research has shown that suppliers are mainly worried that clients, not having an appropriate level of knowledge, will not be able to precisely articulate – mainly at the stage of functional analysis – what functionalities they need and how to implement them to achieve the expected implementation results. As a consequence, chosen system functions are not implemented, or implemented incorrectly by the supplier, based on incorrect information obtained from the client. If this occurs, it may lead to one or a combination of a few types of transaction costs on the supplier's side, i.e.:
1. The costs of adjusting the contract to the changing conditions.
2. Contract monitoring costs.
3. Information asymmetry costs.

Conclusions

The research has shown that in Poland, during the period between 2010 and 2014, the average percentage of IT systems that ended in full success equalled 61%, which means that on average 39% of IT projects ends in partial or complete failure. This indicates that more attention should be paid to analysing the causes of unsuccessful projects. Research up to this date, analysing the factors that influence the effectiveness of IT project completion through outsourcing,

had mainly focused on the questions of project completion, i.e. the methods, techniques and procedures used, or analysing technical and organisational issues, i.e. schedule, risk management, system reliability, the level of customisation, etc. In order to obtain a fuller image of effectiveness analysis for a chosen group of IT projects implemented through outsourcing, it is important to include theories that belong to the new institutional economics, describing business relations between the suppliers and the clients, who are the end users of their services. Additionally, it is advisable to look more widely at identifying the factors that influence project completion separately for the clients and the suppliers, who have different goals and interests in implementing projects.

This article is an attempt to research and interpret which factors influence the effectiveness of completing a selected group of IT projects on the supplier's side. The results of quantitative research have indicated that the presented hypothesis designed as the result of qualitative research has been proven and confirmed. The research has shown that from the supplier's perspective there are seven factors influencing the effectiveness of completing IT projects based on a fixed budget consisting in the implementation of ERP, BI, CRM and DMS systems through outsourcing. The conducted research shows the logic prevalent amongst the suppliers offering their services to enterprises, which can be described as "project profitability defence". In the current conditions of hypercompetition, suppliers are strongly determined to sell services linked to IT project implementation. Considering the fact that most IT projects consisting in the implementation of ERP, BI, CRM and DMS systems are completed based on a fixed budget, suppliers are willing to start a bidding war to win a contract. The area of management support information systems is mainly the market of clients, rather than suppliers. Paradoxically, by choosing the cheapest offer, from amongst offers with comparable project assumptions, the client may behave irrationally.

The research has indicated that the main factor influencing the effectiveness of completing a chosen group of IT projects is achieving planned profitability within a fixed budget. If achieving planned profitability is threatened by unplanned additional task workloads, which may result from a lack of a precisely defined project scope or asymmetry between the supplier and the client, the supplier may try to minimise project completion costs in order to defend the profitability of the project.

The conducted research indicates the logic prevalent amongst the suppliers offering their services to enterprises. A similar phenomenon, however, may occur in the case of implementing IT projects in public administration, also completed on the basis of a fixed budget, and often in the conditions of hypercompetition, where the predominant criterion of offer evaluation is its price.

The aim of the research results presented in this article is to help achieve two goals: indicating the specific character of supplier's perspective and logic in implementing a chosen group of IT projects and hence allowing for more efficient preparation for project completion, both in enterprises and public administration.

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ANALIZA CZYNNIKÓW SKUTECZNOŚCI REALIZACJI PROJEKTÓW INFORMATYCZNYCH

Streszczenie: Skuteczność realizacji projektów informatycznych polegających na wdrożeniu systemów wspierających zarządzanie w Polsce nadal jest na niezadowalającym poziomie, mimo że na tle innych krajów wypadamy nieznacznie lepiej. Prowadzone badania w Polsce wskazują przyczyny tego zjawiska, a także analizują czynniki skuteczno-

ści realizacji projektów informatycznych. Według autora projekt realizacji wdrożenia systemów informatycznych wspierających zarządzanie powinno się badać, uwzględniając również osiągnięcia nowej ekonomii instytucjonalnej, jako transakcję regulowaną kontraktem pomiędzy klientem a dostawcą w całym cyklu życia projektu, a nie tylko jako przedsięwzięcie organizacyjno-informatyczne. Takie podejście pozwala dostrzec problemy i zagadnienia, jakie leżą zarówno u podstaw relacji pomiędzy dostawcą a odbiorcą, a także umów na realizacje projektów, w których cele i interesy dwóch stron kontraktu są sprzeczne. Konsekwencją takiego podejścia jest próba identyfikacji czynników skuteczności realizacji projektów informatycznych z perspektywy dostawcy oraz z perspektywy klienta, które mogą się różnić. Celem niniejszego artykułu jest przedstawienie rezultatów badań dotyczących czynników skuteczności realizacji projektów informatycznych polegających na wdrożeniu systemów informatycznych wspierających zarządzanie klasy ERP, CRM, BI, DMS z perspektywy dostawcy. Głównym problemem badawczym jest weryfikacja dotychczasowych badań autora opartych na studiach przypadku, które pozwoliły postawić hipotezę badawczą dotyczącą czynników skuteczności realizacji projektów informatycznych. Zrozumienie poglądów i map poznawczych z perspektywy dostawcy ma istotne znaczenie dla opisu dominującej logiki działania outsourcingu w zakresie realizacji projektów informatycznych wspierających zarządzanie wśród szerokiego spektrum grupy przedsiębiorstw w Polsce.

Słowa kluczowe: czynniki skuteczności projektu, systemy informatyczne zarządzania, perspektywa dostawcy.